

**AMENDMENTS TO THE CLAIMS**

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1. (original): A process for producing a single crystal of a compound semiconductor, comprising bringing a molten raw material liquid into contact with a seed crystal accommodated in a lower section of a crucible and gradually cooling the molten raw material liquid in the crucible so that solidification of the raw material liquid proceeds upward, thereby growing a single crystal, wherein the seed crystal has a diameter which is 0.50 to 0.96 times that of a constant-diameter portion of the single crystal, and a diameter-increasing portion of the single crystal has a diameter increased during growth of the single crystal such that a peripheral wall of the diameter-increasing portion is inclined at 5° or more and less than 35° with respect to a crystal growth direction, followed by growth of a constant-diameter portion of the single crystal.
  
2. (original): The process for producing a compound semiconductor single crystal according to claim 1, wherein the seed crystal has an average dislocation density of less than 10,000 dislocations/cm<sup>2</sup>.
  
3. (currently amended): The ~~first or second mentioned~~ process for producing a compound semiconductor single crystal according to claim 1 ~~or claim 2~~, wherein the seed crystal has a diameter of at least 50 mm.

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4. (currently amended): The process for producing a compound semiconductor single crystal according to ~~any one of claims 1 to 3~~claim 1, wherein the constant-diameter portion has a diameter of at least 75 mm.
5. (currently amended): The process for producing a compound semiconductor single crystal according to ~~any one of claims 1 to 4~~claim 1, wherein the diameter-increasing portion has a length of 20 to 100 mm as measured in the crystal growth direction.
6. (currently amended): The processes for producing a compound semiconductor single crystal according to ~~any one of claims 1 to 5~~claim 1, wherein the compound semiconductor is a GaAs or InP semiconductor.
7. (currently amended): A single crystal of a compound semiconductor produced through the process for producing a compound semiconductor single crystal as recited in ~~any one of claims 1 to 6~~claim 1, wherein the compound semiconductor single crystal has an average dislocation density of less than 5,000 dislocations/cm<sup>2</sup>.
8. (original): The compound semiconductor single crystal according to claim 7, wherein the compound semiconductor is a GaAs or InP semiconductor.
9. (original): A crucible for growing a single crystal which is employed for a compound semiconductor single crystal growth process in which a molten raw material liquid is brought

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into contact with a seed crystal accommodated in a lower section of a crucible, and the molten raw material liquid is gradually cooled in the crucible so that solidification of the raw material liquid proceeds upward, to thereby grow a single crystal, the crucible comprising a seed crystal accommodation section; a diameter-increasing section which is provided atop the seed crystal accommodation section and which has an outer wall inclined at 5° or more and less than 35° with respect to a crystal growth direction; and a constant-diameter section provided atop the diameter-increasing section, wherein the seed crystal accommodation section has an inner diameter which is 0.50 to 0.96 times that of the constant-diameter section.

10. (original): The crucible for growing the single crystal according to claim 9, wherein the seed crystal accommodation section has an inner diameter of at least 50 mm.

11. (currently amended): The crucible for growing a single crystal according to claim 9 or 10, wherein the constant-diameter section has a diameter of at least 75 mm.

12. (currently amended): The crucible for growing a single crystal according to ~~any one of claims 9 to 11~~ claim 9, wherein the diameter-increasing section has a length of 20 to 100 mm.